AN ANALYSIS OF THE EFFECTIVENESS OF RECORDS MANAGEMENT

THESIS

Dale R. Austin, Captain, USAF
Peter M. Moseley, Management Analyst GS-12

AFIT/GIR/LAR/94D-1

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

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Requirements for the Degree of
Master of Science in Information Resources Management

Dale R. Austin,
Captain, USAF

Peter M. Moseley,
Management
Analyst, GS-12

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Preface

This research gave us the chance to address issues of importance to the entire records management community. Our close relationship with Air Force Materiel Command (AFMC) brought us into contact with people who provided valuable (and appreciated) assistance to the research team. Major Maureen Casey commissioned this study and was instrumental in providing direction and in leading us to sources of information. Wanda Dunning, as command records manager for AFMC, was helpful in providing information about Document Librarian and also educating us on Air Force records management. Janet Riley, forms designer at AFMC, volunteered time to assist the research team in developing of the survey instrument. Twelve other members of AFMC also supported us with our survey by completing the somewhat lengthy questionnaire, even during a time of great organizational upheaval for them. Thanks also to the thirteen members of our Delphi panel who responded without complaint to the four round process of questioning. Their efforts and expert insights enabled us to complete this research with results that are useful to the sponsor and to anyone interested in records management.

We have to thank our wives, Judi Austin and Sandie Moseley, who endured many long and lonely evenings throughout the past year in addition to giving us moral support. We must also thank our Lord Jesus Christ who was there in both bright and dark hours with His abundant provision.

Finally, we thank Dr. Guy Shane and Major Mark Kraus whose patience made the many elements in this process come together with success.

Dale Austin
Pete Moseley

Table of Contents

Page

List of Tables

Abstract

This research was performed for the dual purpose of defining effectiveness as it applies to the field of records management (RM) and studying the impact of Document Librarian (DL) on the productivity of Air Force records managers. The main thrust of the study was to define effectiveness for RM because no industry standard had previously been developed. The definition was generated through the use of a Delphi process with a group of RM experts serving as the panel. Four rounds of questioning were administered during the Delphi before an acceptable consensus was reached.

The Delphi developed an effectiveness definition by highlighting major functional areas which a RM system must be able to successfully perform. The functions include storing to eliminate loss, screening records for compliance with Freedom of Information Act and Privacy Act requirements, retrieving documents by a predetermined field, grouping records for archival storage in accordance with regulations, and indexing files by predetermined unique characteristics.

DL is a RM software package developed jointly by Air Force Material Command (AFMC) and Wang Laboratories. The software went through an extensive development process, with the AFMC personnel maintaining high expectations for its performance. The impact of DL on the productivity of RM was tested through the use of a customer satisfaction survey. Survey questions focused on areas such as satisfaction with reliability, effect on job performance, ease of use, utility, and overall appraisal.

The customer satisfaction survey of DL revealed that the software has not broken any records from a user satisfaction point of view. Respondents indicated that they had not significantly improved their RM productivity with DL's capabilities. They also indicated the software is not significantly easier to use or learn or even more user-friendly than other software, leaving the product's testers unsure as to whether DL's usefulness warrants its purchase and wider distribution throughout the Air Force.

The research team made the following recommendations. DL should be used for a longer period of time and by a larger number of users before its performance is evaluated. The effectiveness functions highlighted by the Delphi should be included in any new customer satisfaction survey for DL as a means to verify that the software adequately addresses the needs of the RM community. Finally, the entire Air Force process of RM should be reviewed for possible improvements before integrating RM software. This would avoid the automation of an already ineffective process.

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I. INTRODUCTION

The procurement and implementation of new computer-based information systems is a frequent occurrence in the Air Force as the service strives to improve productivity in its administrative tasks. The Air Force routinely brings new systems on line in an effort to improve control of its records management (RM) process as well as its immense accumulation of paperwork. Although managers use many scarce resources to achieve this improvement, actual changes in productivity are seldom measured, since no standard for measurement exists.

The private sector is used as the primary source of data for the problem description in this study because of the focus of existing research. Although this thesis is sponsored by an Air Force organization, the research team has been unable to find any Air Force data regarding the quantity of records produced and stored, or of RM productivity.

As a matter of course in business, the United States is inundated with huge quantities of paper. Every year the private sector alone produces over 70 billion documents, adding to the nearly 600 billion documents already in storage ("Records Management Program...," 1991:44). The effect of this disposition is to force management to effectively control the maintenance, storage, and disposal of documents (Jones, 1993:10).

Improper handling of documents contributes greatly to lost profits and costly litigation, making RM a critical function in business (Jones, 1993:10). The need for an extensive program of RM is illustrated by the frequent occurrence of the following problems: "the severity of revenue loss due to poor

records programs; prolonged time for retrieval of information from existing records; increasing reference to active and inactive records; the volume of records created by the business; the degree of inefficiency and disorganization of the present filing and inactive records storage systems" (Jones, 1993:17).

The business environment has created a voracious appetite for technologically advanced products in the RM field as computer-based systems use is greater than ever (Hodges, 1993:32). The force of this demand is so great that information technology is now the largest sector for spending in corporate America (Schnitt, 1993:14). However, these programs are often implemented without an actual definition of productivity and effectiveness. In addition, the problem is confounded by the failure to clearly delineate the expected benefits of these programs. Evidence suggests that this investment in technology hasn't produced the improvements desired. Despite the enormous expenditures for information technology, more paper is generated today than ever before, yet productivity has grown only 1.6 percent in the last decade (Penn, 1992:20).

One study found that rather than having more work done using fewer resources, computers simply foster more computer-related activities. The study came to three sweeping conclusions:

- Businesses use much of the information technology as strategic management tools to increase market share rather than adding value to products and services
- Executives may generate more information rather than reduce staff
- Information technology is not readily substitutable for information labor. Technology requires more information workers as the price of technology falls (Duncan, 1991:41)

A critical element for records managers to remember is the need to know in advance of employing a new RM system exactly what kind of benefits an organization needs in order to justify purchase of the system (Schnitt, 1993:15, 41). An organization should also be able to accurately measure the effectiveness of a new system after its implementation. In a recent survey, respondents were asked to outline the steps they had taken to measure the productivity of their new systems. The results showed that none of the managers polled did anything to evaluate a return on investment, yet some of them had spent as much as 20 percent of their annual budgets on the new technology (Duncan, 1991:42-43). "In the absence of appropriate tools to assess the effectiveness of information technology, management will continue to base decisions on intuition and gut feel" (Duncan, 1991:44-45).

At the headquarters of the Air Force Materiel Command (AFMC), Wright-Patterson Air Force Base, Ohio, the personnel in charge of developing new software systems for the Air Force are aware of the risks and the frequent disappointments of implementing new technology. Experience has shown the problems often encountered when taking unnecessary risks with new systems. Furthermore, they are mindful of the fact that no appropriate measures exist for defining effectiveness in RM. To circumvent potential problems before deciding to distribute new electronic RM systems throughout the Air Force, the AFMC Corporate Information (CI) developers commissioned this study to address the problem.

Specific Problem

The purposes of this research are to develop a definition of effectiveness for the field of RM and to evaluate the impact of a modern office

automation system, specifically in the field of electronic RM. The research will establish and define effectiveness measures for RM and evaluate the extent to which one applicable electronic technology product enhances or detracts from that effectiveness.

Investigative Questions

1) How is effectiveness defined for RM?

Developing a definition for RM effectiveness is the main purpose of this research. The goal is to provide managers with a standard by which any potential acquisition of RM hardware or software can be measured. Since resources are often wasted on unproductive RM systems, a definition of what performance criteria a new system must meet in order to be effective at managing records should preclude such waste.

2) How does Document Librarian impact the process of RM?

The research team will use a survey to assess the customer satisfaction of a new software product developed for the Air Force. The research sponsor commissioned this study to evaluate the impact of the new system on organizational productivity.

Simultaneous research will be conducted on both of the investigative questions. As the Delphi process is being accomplished to address question 1, the research team will also administer the survey to the test population to address question 2.

II. EFFECTIVENESS FOR RECORDS MANAGEMENT

As an investigation into effectiveness for the field of RM, this chapter includes a review of literature regarding effectiveness and legal issues facing records managers. The rest of the chapter contains the methodology for answering the first investigative question and the results of carrying out that methodology.

Effectiveness in Records Management

If this study is to define the measures of effectiveness for RM, then a definition is needed for exactly what is to be measured. One source defined work measurement in general as "the time for a qualified worker to carry out a specified task at a defined level of performance" (Boyd, 1992:21). If that is true then what task or level of performance should a records manager measure? Suggestions come from a variety of sources.

Weill and Olson conducted comparative case studies on the use of information technology across five different industries. The following three primary findings of the research reflect common arguments among information professionals.

1. The need to define and track information technology expenditures throughout the [organization] is critical, especially as information technology (IT) management becomes more decentralized.

2. The difficulty of determining the return on IT investments is a major stumbling block for many [organizations].

3. Investment in information technology alone is not enough, it must link to business strategy. (Duncan, 1991:42-43)

Graham claims that if a records management system is to be effective it must provide tactical information which details the critical organizational functions (1991:57). Also, effectiveness in records management can be measured by lower operating costs, improvement in the rate of lost and misfiled documents, faster customer service, and a reduction in the number of personnel required to run the program ("Records Management Program...", 1991:45). Another source claims that effectiveness can be measured by the degree of work flow improvement and the reduction of necessary steps which are achieved through functional process improvement (Dykeman, 1992:54).

The Olsten Corporation has established an award for effectiveness in RM which clearly outlines the criteria for judging effectiveness. The areas evaluated include the following:

> cost savings
> space savings
> speed of access of records
> integration of records stored on different formats
> management support of the RM program
> improved service
> labor savings (productivity enhancement)
> quality of training
> centralization of records storage
> elimination of lost / misfiled records
> ("William Olsten Awards for Excellence...," 1993)

As this section illustrates, the information industry in general and records managers specifically cannot agree on what is required for an organization to be effective at managing records. The literature reveals that although several definitions for RM effectiveness have been proposed the substance of any specific definition is simply the opinion of the article's author; there is no industry standard. The lack of an accepted standard has prompted this thesis research.

Legal Issues

As advanced technology plays a bigger part in handling records, management is faced with critical legal issues. These issues provide conspicuous evidence to the importance of managing records effectively--to the necessity of doing the job right. Any employment of new technology to accomplish the RM task must be evaluated for more than just the speed or ease it brings to the process. To illustrate the point, federal and state governments regulate the length of time that a record must be maintained on file or in storage. For example, The Air Force's Records Information Management System (RIMS) is a database containing in-depth rules for retention of official documents. Retention and destruction schedules are often developed to control record disposal procedures for an organization (Sampson, 1989:80). In professions such as insurance, medicine, law, and finance where the main product is a service, managers depend heavily on the RM process for proof of nearly every aspect of outside transactions (Jones, 1993:10). Maintenance of an appropriate disposal policy can save large sums of money in legal fees and penalties. Some of the risks of inadequately maintaining records include:

> loss of [legal] rights, ... including government contracts, prosecution for obstruction of justice if materials are deliberately destroyed when litigation or government investigations are pending or in progress, contempt of court for deliberately destroying subpoenaed evidence, and presumption of guilt or other adverse inferences that come from not having [accountable material]. ("Records Management Program...", 1991:45).

The threat of legal action is as prevalent in the public sector as it is in the private sector. One RM consultant states "Improper or inadequate records always open the door to litigation, ... preparing complete

documentation ... is the most proactive measure a company can take. And government agencies are equally obligated ..." (Dykeman, 1992:52). An example of the importance that some government agencies are placing in RM is found in the New York State Department of Transportation. Department managers have classified RM employee positions as absolute priorities and have funded RM functions as risk management activities in order to decrease the rate of loss due to litigation (Dykeman, 1992:52).

A common problem experienced today arises from widespread down-sizing in both the public and private sectors. RM professionals tend to be either clerical personnel or mid-level managers, each being a frequent target of job cutting tactics. Consequently, RM procedures are often delegated to personnel who are inexperienced and uninterested in appropriate RM practices, resulting in misfiled, lost, or improperly disposed of documents (Jones, 1993:10-11). For organizations that fail to adequately consider their RM responsibilities the costs can be exorbitant. For example, Piper Aircraft lost a $10 million judgment because of a failure to retain a single, critical document ("Records Management Program...", 1991:44). To prevent such an incident, common practice is for the records manager to consult auditors and attorneys before establishing retention and destruction policies ("Records Management Program...", 1991:46). Once those policies are established, the RM staff must adhere to them rigorously and be able to prove in court exactly how and why documents are destroyed. Employment of computer technology to automate the process should not only be weighed on a cost/benefit basis, but should also be carefully configured to fit the organization's unique operating environment (Jones, 1993:14).

Delphi Technique

The Delphi method is a technique for obtaining a consensus of a panel of experts. The technique is designed to capture informed judgment from experts and to provoke candid answers by avoiding direct confrontation (Brown, 1968:3). The experts are questioned in a series of rounds which allows them to consider responses of peers as they contribute their own judgments to the process (Brown, 1968:1-3). Objectives of Delphi include forecasting, qualitative evaluations, and consensus (Sackman, 1975:8). The reward for undertaking the Delphi process is the development of a group standard which will advance research for an area of application where no expert consensus formerly existed (Sackman, 1975:6).

The obvious frailty with the validity of expert opinion is finding an adequate definition of expert. Brown suggests some criteria:

1) status among peers

2) years of experience

3) self-appraisal of competence

4) quantity of relevant information the individual can access

(Brown,1968:4).

The results of the Delphi process are usually just a measurement of the experts' perspectives on the propensity of events to occur in the future, without actually measuring the events (Sackman, 1975:16). Brown sums the role and usefulness of experts as follows:

> We use an expert because he has at his disposal a large store of background knowledge and a cultivated sensitivity to its relevance which permeates his intuitive insight. We need a consensus of experts because individual experts will disagree and we are unwilling to rely on the judgment of a single specialist. (Brown, 1968:13)

In conclusion, effectiveness is a critical issue for records managers. Some criteria for measuring effectiveness have been discussed in this chapter. Although no single effectiveness yardstick exists, the records manager is faced with the challenge of evaluating the quality of the process under his responsibility to determine what will best enhance the effectiveness of that process.

Research Design

The method chosen for defining effectiveness for RM is the Delphi technique. The Delphi technique, as described earlier in this chapter, is a method of research designed to develop a consensus of opinion among experts in a particular profession. The purpose is to obtain informed judgment from experienced individuals who possess relevant information for solving problems in their field of expertise (Brown, 1968:3-4). A successful Delphi will develop a standard or measure which will advance research in an area where no consensus existed previously (Sackman, 1975:6). This research will attempt to do just that--attain a consensus from experts in an effort to define effectiveness for the field of RM, where no such consensus exists.

Delphi Methodology

The first step in the Delphi is to choose the experts who will participate. The group will consist of former graduates from the Air Force Institute of Technology (AFIT) in the discipline of Information Resources Management (IRM). These participants are defined as experts because of two major criteria. First, they all have at least four years of experience within the RM environment in positions of responsibility and leadership as both

enforcers of RM policy and as innovators in the field. Second, they are the functional RM experts in the Air Force because of their graduate education credentials.

To obtain expert participants in the Delphi, the research team will send a request for participation to all Air Force officers who qualify as experts as described above. The actual number of participants will depend on the number of responses received from individuals willing to participate.

Conducting a Delphi involves an iterative process incorporating several rounds of questioning and consensus building tactics (Brown, 1968:3). The first round will consist of questions developed from the results of a Functional Process Improvement (FPI) process conducted at the Pentagon for the Office of the Secretary of the Air Force. The FPI contained an evaluation of RM effectiveness criteria cultivated from exhaustive meetings of RM professionals Air Force wide. Results from the FPI will be used because they represent the only benchmark for RM effectiveness that is available with unique Air Force pertinence. Furthermore, the FPI employed a consensus-gathering method to develop effectiveness criteria among individuals who have some degree of knowledge and experience in RM. These effectiveness criteria will form the basis of questioning for the Delphi panel in an attempt to either validate the results of the FPI or to create new and more precise measures of effectiveness using experts.

The Delphi will be conducted in two phases. The first phase will be a rating of the importance of each function being considered. Delphi panel members will be asked to rate the importance of the issue stated with a number from one to seven, one being very unimportant and seven being very important. The mean and range will be obtained from the responses of each

statement with the results and the original statements returned to the participants in any necessary subsequent rounds. This will provide the panel members with the opportunity to reconsider their original responses in light of the responses of the entire panel. Any change that a participant decides to make to his or her original response will be done at this point. The purpose is to bring the panel closer to reaching consensus--by being allowed to reflect on the responses of the group as a whole, they can reevaluate their own opinions and make any appropriate modifications to their original answers.

The second phase will be a rank ordering of those functions to determine their relative importance. The same nine statements included in the first phase rounds will be used. The participants will then be asked to provide their opinions of the order of importance of the issues, ranking them from one to nine with one being the most important and nine being the least important. As in phase one, the panel members will be given the opportunity to reevaluate their responses and make any desired changes in later rounds. This will be done in an effort to provide closer agreement among the experts.

The phase 1 instructions to be provided to the participants and a description of the records management functions proposed for consideration are reproduced in Appendix A. The phase 2 instructions are reproduced in Appendix B.

The purpose of the Delphi is to generate information which could be used by managers to help them in developing information systems for their organizations. An expert-generated list of critical issues ranked in order of importance is seen by the researchers as helpful to managers in decision making.

Once the panel has reached consensus regarding the ranking of the issues provided to them, the Delphi will be complete. At that point, the research team will have developed an expert consensus regarding the most important issues to be addressed when considering a purchase of a system for managing RM--a definition of what a system must be able to accomplish in order to be effective at managing records.

Delphi Results

This section describes the data collected by administering the Delphi process. The Delphi results are summarized, showing how consensus was reached, and sample instructions are given to show how the process evolved.

Participants

Forty-eight potential Delphi participants were solicited, thirteen actually agreed to be panel members. All participants were graduates of the AFIT IRM program, and possessed at least four years of experience with the RM field.

Round One Results and Comments

The results of round one and round two are listed in Appendix C. The various functions rated represent the rows, and the rating scale of one to seven is reproduced to create the columns of the table. The data represent the frequency that a particular score was chosen for a particular function. Descriptive statistics appear in Table 2 for comparison with round two.

Round One Feedback and Comments

The following text lists the numerical results of round one that were given to the participants for a second round. It is included here because the bulk of comments received appeared in the first round. Information given included the range of values, the most common value (mode), any exceptions to the range (single occurrence deviations were considered exceptions), comments related to the exceptions, and general comments or comments unrelated to the exceptions for each of the nine functions. Individual scores were not returned to the participants due to an administrative oversight.

a. Filtering information
Range of responses: 4 to 7
Most common rating: 5
Exception(s): 2

Comments related to exceptions:
Filtering information needs to be a manual process done by the owner of the documentation. I don't need the machine to tell me whether an item should be put into the records management system. I just need it to be simple to add records I do want to file.
Comments unrelated to exceptions: None

b. Making records
Range of responses: 5 to 6
Most common rating: 6
Exception(s): 3,7

Comments related to exceptions: None
Comments unrelated to exceptions: None

c. Assigning disposition instructions automatically
Range of responses: 5 to 7
Most common rating: 5
Exception(s): 2,3,4

Comments related to exceptions:
Please remember that BASE X is drawing down. We are very concerned about the transfer and destruction of records (h & i). In the overall picture of an operational base, people don't pay as much attention to the eventual disposition of the records as they should. Therefore, it is up to us to find and correct years worth of mistakes before disposing of records [editors note: seems to be related to c but was reported with miscellaneous].
Comments unrelated to exceptions: None

d. Indexing records automatically
Range of responses: 4 to 7
Most common rating: 6
Exception(s):

Comments related to exceptions: None
Comments unrelated to exceptions: None

e. Storing records
Range of responses: 6 to 7
Most common rating: 7
Exception(s):

Comments related to exceptions: None
Comments unrelated to exceptions: None

f. Screening records
Range of responses: 6 to 7
Most common rating: 6
Exception(s): 3

Comments related to exceptions: None
Comments unrelated to exceptions: None

g. Retrieving records
Range of responses: 4 to 7
Most common rating: 7
Exception(s): 3

Comments related to exceptions:
Ease of retrieval has NOT always been a prime concern of NARA (officially, it was; but practically, is was NOT). With digital records, retrieval issues should be easily addressable up-

front: Coding (retention) schemes and standards must be ongoing concerns in this area.

Ultimate security of federal records is of paramount importance, and this will continue to be a prime objective of the federal records system.

Comments unrelated to exceptions:

NOTE: Isn't this really two different questions, one dealing with locating records and the other dealing with access rights and security? These are two different activities.

h. Allowing the transfer of records to permanent storage sites and maintaining a detailed audit trail

Range of responses: 5 to 7
Most common rating: 6
Exception(s): 4

Comments related to exceptions: None

Comments unrelated to exceptions:

Another two-part question. Transferring records from one location to another and auditing those transfers are two entirely different activities.

i. Destroying records automatically, in accordance with prescribed retention directives

Range of responses: 5 to 7
Most common rating: 5
Exception(s): 1,3

Comments related to exceptions:

Automatically queuing records for human review would be a 7. I don't want the system automatically destroying anything without someone checking the destruction queue first, though.

Comments unrelated to exceptions:

Destruction of records should be a task that you are prompted to do on a set interval (monthly?) so you are not continuously confronted with records to be destroyed. Automatic destruction of records should not be done without notification.

Retention of records is (or at least has historically been) based on the value (or evident potential value) of the information contained. This is reflected in disposition codes. These codes are placed on documents/records either manually,

or through some use of appropriate automation; but the rationale is always dependent on human interpretation. Thus I would NOT want to see any system which would AUTOMATICALLY destroy/dispose of records without a second look. I would want to see a system that would alert both the record owner and the resident records management expert that a record is due for ultimate disposal.

Other miscellaneous comments:

Hopefully your thesis team is talking with Darryl Prescott at SAF/AAIXI. He feels (and I agree) that 6000 tables and rules for the disposition of official records is INSANE!!

I'm also sure you're looking at the Document Librarian program coming out of AFMC. We're looking at implementing it here (it would be more correct to say we'll implement unless someone tells us not to!!).

Round Two Results and Comments

The results of round two are listed in Appendix C for simplicity in comparing round results. No significant comments were received. Although the round one scores were not provided as feedback, the consensus got better as demonstrated by the means and standard deviations in the following table.

Table 1

DESCRIPTIVE STATISTICS FOR ROUNDS ONE AND TWO

Function	Round	AVG	STDev
a. filtering	**r1**	5.15	1.34
	r2	5.00	1.35
b. making	**r1**	5.54	0.97
	r2	5.69	0.48
c. disposition	**r1**	5.46	1.56
	r2	5.62	1.04
d. indexing	**r1**	5.77	1.01
	r2	5.92	0.64
e. storing	**r1**	6.85	0.38
	r2	6.92	0.28
f. screening	**r1**	6.31	0.48
	r2	6.31	0.48
g. retrieving	**r1**	5.85	1.41
	r2	6.08	1.26
h. transfer to storage	**r1**	5.85	0.80
	r2	5.92	0.64
i. destroying	**r1**	5.23	1.74
	r2	4.62	1.56

Round Three Instructions

Satisfied with the results of rounds one and two at reaching consensus on rating of the functions, we shifted emphasis to a ranking of the functions in an attempt to cross-check the opinions of our experts. This method had

also been specifically discussed with our sponsor in an effort to produce weighting factors for evaluation of future records management systems, whether they would be research and development projects or commercial off-the-shelf products.

Round Three Results and Comments

Appendix D shows round three and four results in a format similar to Appendix C. The rows represent functions to be ranked and the columns the frequency of choice of each rank. Descriptive statistics appear in Table 2.

Round Three Feedback/Preparation of Round Four

The results from round three were given back to the participants in summary form, including:

- previous ranking for each individual (given privately and accomplished at email time)
- each function and all ranks selected for it
- mean and standard deviation of those ranks

* NOTE that the previous round's ranking for each individual was included as feedback.

Round Four Results and Comments

The results of round four are listed in Appendix D. Descriptive statistics are provided in table 2 for simplicity in comparing round results. No significant comments were received.

Table 2

DESCRIPTIVE STATISTICS FOR ROUNDS THREE AND FOUR

Function	Round	AVG	STDev
a. filtering	**r3**	7.54	1.81
	r4	7.54	1.71
b. making	**r3**	5.69	2.21
	r4	5.38	1.94
c. disposition	**r3**	5.00	1.68
	r4	4.69	1.38
d. indexing	**r3**	5.08	2.14
	r4	4.62	0.65
e. storing	**r3**	1.62	1.94
	r4	1.62	1.94
f. screening	**r3**	3.15	1.91
	r4	3.08	2.25
g. retrieving	**r3**	3.46	1.66
	r4	3.31	1.60
h. transfer to storage	**r3**	5.92	1.55
	r4	6.77	1.64
i. destroying	**r3**	7.54	1.66
	r4	8.00	1.35

Analysis of Results

For purposes of discussion, we will call rounds one and two the rating or first stage and rounds three and four the ranking or second stage.

Feedback data. At least one clear pattern emerged to distinguish a given function as universally important to all participants. Function E,

storing records, had the highest mean of over 6.9 in the rating stage and was almost unanimously ranked number one. The exception was the outlier case; a single participant who often disagreed with the others and never changed his mind between rounds. This person's choices were not considered significant enough to interfere with consensus, however, so they remain in the data set.

In the rating stage all of the functions were considered important to the process, and only one mean in either round was below 5.0. That one mean belonged to the clear loser, however, as the ranking stage gave it a clear ninth place and earlier comments disclosed that Function I, destroying records (in an automatic fashion), was unwelcome in any system.

Consensus. If no progress or negative progress had been reached toward consensus in each round, we would have stopped the process at that point. Since progress was made with the majority of our functions in each of our rounds (as measured by a decreasing standard deviation), we continued until the extent of time available was reached and declared closure based on the indication of the thesis advisors.

III. THE IMPACT OF DOCUMENT LIBRARIAN ON RECORDS MANAGEMENT

This chapter includes discussions on new advances in the area of electronic imaging and then some examples of the successes and failures resulting from the implementation of information technology. These examples highlight the trends in RM that justify the need for further research regarding the impact that electronic technology has on the records management process. The remainder of the chapter contains the methodology for answering the second investigative question, and the results of carrying out that methodology.

Electronic Imaging

A significant although quite new addition to the tools of records management is electronic document imaging. In contrast to photographic imaging (microfilm), an electronic imaging device scans a document and creates a bit map for storage on magnetic or optical disks (Shaw, 1993:10). The chief benefit of electronic over photographic imaging is the rapid retrieval facilitated by the electronic storage medium. An image can be retrieved in seconds which is a dramatic improvement over the often lengthy searches necessary for microfilm (Shaw, 1993:10).

Another benefit is the capacity to share access to documents across a wide band of users (Corbin, 1992:20). If a record must be processed by workers in different locations, each has ready access to the record which can sometimes eliminate days of transit time (Shaw, 1993:10). Government organizations can particularly benefit from this capacity due to the method

by which much of the work is accomplished. Often employees at several levels of management or in different areas of responsibility review and share documents. When such documents can be passed from one work station to another in a matter of seconds using electronic imaging, the opportunity to improve productivity is attractive.

The principal obstacle preventing the wide use of electronic imaging to route work flows has historically been the requirement of additional purchases of hardware to facilitate the application. The costs of bringing imaging systems on line has commonly run between $50,000 and $500,000 (Corbin, 1992:20). Only in recent years have software engineers been able to accommodate users with products that can be installed on computer systems already in place (Shaw, 1993:12). Consequently, the use of imaging to route work flows is on the increase. Several commercial vendors now market work flow software packages that, with the attention of a systems administrator, can be uniquely tailored to an organization's needs at dramatically reduced costs (Shaw, 1993:10).

Still, the main use of electronic imaging is to store records on optical disk to eliminate the need to store large quantities of paper files. The Air Force Military Personnel Center at Randolph Air Force Base spent $5.8 million in 1992 for an imaging system which will be used for storage and retrieval of thousands of personnel records from around the Air Force (Corbin, 1992:21). Most organizations require some degree of retention of historical data as a matter of policy to satisfy both legal and operational concerns. Imaging is popular for this purpose because of its efficiency in storing and retrieving documents ("DMI Has Solution...", 1993:48). Other commonly used long term storage mediums such as magnetic tape, microfilm,

and microfiche have consistently proven to be inefficient and somewhat insecure methods of managing historical data ("DMI Has Solution...", 1993:48). Optical disks, which are the standard medium used with imaging for long term storage, provide easier and faster retrieval of records, as well as the additional benefit of security since the disks cannot be altered ("DMI Has Solution...", 1993:48).

Despite market trends, opinions vary widely as to the contributions that electronic imaging can make to the effectiveness of records management. The early users of imaging equipment experienced some significant disappointments which could have soured RM professionals on the technology. However, the consensus is that imaging will have a noticeably positive impact on the dependency on and proliferation of paper, the speed of access of information, and the cost of physically storing documents (Corbin, 1992:20).

Another key issue is whether electronically reproduced documents will stand up as evidence in court. No clear precedent exists to serve as a definitive guide to management (Boudette, 1990:64). Microfilm is admissible as evidence under the guidelines of the Uniform Photographic Copies of Business and Public Records Act and most federal managers feel that the courts will grant electronically reproduced documents the same weight (Sampson, 1989:80). This assumption, however, has not yet been tested at all levels of the judicial system. There are some federal and state statutes that mandate certain records being maintained in paper form for a specified period of time or until they are obsolete (Sampson, 1989:80). Furthermore, electronic data is at present not generally accepted as judicial evidence (Sampson, 1989:80).

Successful Implementation of Technology

Because the purpose of this study is to evaluate the impact of technology on the effectiveness of records management, information about successes and failures of technology implementation is necessary to provide justification for research. Many examples of each exist: this section deals with successes found primarily in the public sector.

The Social Security Administration, in response to intense pressure to cut costs, developed a new program to modernize the agency's business processes. The agency integrated commercial telecommunications lines with updated computer technology in an effort to reduce costs and improve customer service (McDonough and Buckholtz, 1992:34). Customer inquiries that were previously done on paper could then be done by computer. The payoff has been a reduction of 17,000 positions along with impressive reductions in the length of service delivery time (see Table 3). In addition to reduced customer service delivery time, the agency has also realized an excellent improvement in the rate of payment errors; one county's error rate dropped by more than 85 percent (McDonough and Buckholtz, 1992:34).

Table 3

SERVICE DELIVERY IMPROVEMENTS OF THE SSA

(McDonough and Buckholtz, 1992:34)

Service	1982	1991
Card Receipt	6 weeks	3-5 days
Annual Wage Postings	4 years	6 months
Cost of Living Adjustments	3 weeks	1 day
Emergency Payments	15 days	3-5 days

Several federal agencies have implemented pilot projects using electronic imaging systems with dramatic results. Productivity has improved, operations have been streamlined, customer service has improved, and entire functional processes have been curtailed (Boudette, 1990:61-62). As one noteworthy illustration, the Federal Deposit Insurance Corporation (FDIC) used a new optical disk system to replace an outdated system of paper files and microfiche. Using the new storage medium has improved both the FDIC's service to its member banks and the service that banks provide to the general public. The improvements include a reduction in the amount of time that staff spends on research, improved security of the stored data, and such a large reduction in the quantity of paper generated that the paper documents which could fill a space estimated at 8'x35'x50' are condensed to 50 optical disks (Arend, 1993:55).

A conspicuous example at the state level of new-found success in the RM field has occurred at the Kansas Department of Health and Environment (KDHE). The agency is responsible for maintaining over eight million records for the state and performs approximately 350,000 transactions with the public each year ("Records Management Program...", 1991:50). Two main problems prompted KDHE to develop a new RM system: 1) response time to customer requests for copies of records was 3-5 weeks and 2) the excessive quantity of film and paper records required the use of five different locations with under-ground vaults for storage ("Records Management Program...", 1991:50).

After three years of investigation of legal and accounting requirements as well as budgetary fights, the new system was implemented. The final product integrated an IBM mainframe database with an NCR minicomputer

and a FileNet image system ("Records Management Program...", 1991:50). Several benefits were quickly realized including a reduction of transaction error rate of 30 percent to less than 4 percent, a virtual elimination of data entry by state personnel, and a reduction in the customer request response time from 3-5 weeks to as little as 11 seconds ("Records Management Program...", 1991:50).

Failures of Technology to Improve Effectiveness

The growth in the availability of information technology has attracted the interest of many managers seeking to improve the financial and functional performance of their areas of responsibility. However, when managers who lack experience and knowledge of information technology make purchasing decisions, the organization can quickly run into unforeseen problems (Corbin, 1992:41). The General Accounting Office in 1992 reported that many information technology systems throughout the federal government were not only inadequate for their intended functions, but were so poorly managed that many bad situations were made worse (Corbin, 1992:44). Nolan Norton Industries investigated 600 imaging test projects and collected very negative data. Nolan found that 17.3% of the new projects had positive progress, 2.1% had negative progress, and 80.6% had no progress (Booker, 1990:89). However, one industry leader at International Data Corp. (IDC), in Framingham, MA claims that the large number of firms showing no progress simply indicates poor management of the technology and information systems in general. IDC conducted an independent study of 225 on-site imaging systems and found only 14 percent to have experienced any problems at all (Booker, 1990:89). IDC goes further to claim that most of the

problems that do occur are caused by managers who attempt to automate processes which aren't fully understood by the organization (Booker, 1990:89).

The California secretary of state's office in March of 1989 installed a $4 million system from FileNet Corp. in an effort to improve the management of commercial filings. The outcome is now infamous within the information management profession. The contract was for an integrated system of computing and imaging, but problems came about immediately after implementation. The department was never able to accomplish the required amount of work within any single day. The most successful production level ever achieved while using the new system was to process 30 percent of the workload demanded (Booker, 1990:89). Predictably, the customers of the Secretary of State's office were highly displeased about what ultimately became a two-month backlog of work. This forced the state to remove the system and employ 250 extra people working around the clock to catch up on the backlog (Booker, 1990:89).

The field of information technology in general has come under fire from managers for its apparent inability to bear fruit in the area of productivity. In the 1980's, productivity in the manufacturing sector increased 44 percent, but in the service sector, where 85 percent of IT spending occurs, productivity increased less than 2 percent (Schnitt, 1993:15). The Massachusetts Institute of Technology (MIT) studied this data and determined that "'Expenditures on IT capital were less effective in improving productivity than any other type of expenditure considered'" (Schnitt, 1993:15). Most troubling for the IT industry was the finding that

the most productive organizations studied committed less capital on IT than those organizations with average productivity (Schnitt, 1993:15).

Schnitt suggests that the reason for the general lack of productivity improvement is the tendency of workers to concentrate on the technology itself rather than what the technology can do for the organization (Schnitt, 1993:15). IT professionals frequently design computer systems to fit into existing work processes without questioning whether the processes themselves are the most productive method of performing the work. To illustrate, the increase of productivity in the manufacturing sector is credited to the increase in foreign competition, which is greater for manufacturers than for the service sector. The competition forces manufacturers to improve productivity and in turn compels them to use investments in IT to make changes in the way workers perform their jobs. This is what is lacking in the service sector (Schnitt, 1993:15-16).

In today's working environment, with the pressures of budgets as severe as they are in government and in business, managers must be as certain as possible that information technology will actually improve their RM activities before committing the capital to acquire that technology.

The previous sections of this chapter comprise a discussion on how electronic technology affects the RM process. The following section is a description of the method to be used in evaluating the unique impact of Document Librarian on that process.

Survey Methodology

The sponsor of this research, AFMC Corporate Information (CI), has introduced into AFMC headquarters the commercial RM software product,

Document Librarian (DL). This study will incorporate a customer satisfaction survey of the population which is testing the new product.

Emory and Cooper state that the most appropriate employment of a survey is with a population "where conditions indicate that respondents are uniquely qualified to provide the desired information" (1991:319). The population testing DL is the principal user group of the software. Not only are they experienced with the product but they also have a vested interest in its effective performance.

The type of survey to be used is an evaluation survey as suggested by Fox (1969:434). This is most suitable because an evaluative judgment can be made in a situation with a criterion measure (user satisfaction), and the survey can be carried out using a single test group (Fox, 1969:434). Fox also states that an evaluation survey is particularly suited to measure a change over time (1969:436). Since this research seeks to identify how well the users of the RM software are satisfied with the product, the perceived change in RM effectiveness on the part of the test population occurring after DL's implementation is what will be measured.

Survey Instrument. Section 1 of the survey will gather demographic data on the population. Section 2 will relate to satisfaction with the various aspects (from security to convenience) of DL. Finally, section 3 will deal with an overall impression of its user 'feel' (from the user interface to ease of learning). Questions in sections 2 and 3 will be a rating on a scale from 1 to 7 with a value of 1 being unfavorable and a value of 7 being favorable. A value of 4 will represent a neutral position. For the convenience of the

reader, the survey questions, in the form presented electronically to the participants, are reproduced in Appendix E for reference.

Instrument Validation. The source of the instrument is a master's thesis written by Randall R. Bradford (1993). Bradford tested the validity of the instrument and reported a Cronbach's Alpha of .96, indicating that the instrument is internally consistent. Since the source questionnaire was tailored to an electronic mail system, this thesis team will make minor modifications to the questions to tailor the instrument for the DL application. Also, one question in the source instrument which appears to duplicate another question will be eliminated in this instrument. The numerical ranges on all demographic items will be changed to make them mutually exclusive.

The altered survey instrument will be validated prior to being submitted to the test population. The purpose is to test whether the questions asked are clear and that respondents understand the intent of the question. The population which will be used for validating is 10 members from AFMC/CI, who are the sponsors of this research. They will be given the survey and asked to suggest changes in the wording and the structure of the instrument that would make it easier to understand and answer. Once this process is complete, the final survey will then be submitted to the test population.

Analysis of Survey Results. The data collection process will begin with the generation of the survey instrument. The survey to be used was design to gather data about both user demographics and satisfaction with the product. The questions will be tested initially to evaluate their content validity.

To convert data into useful information, the team will analyze the survey results in several areas. The first area of interest will be the demographic responses. A compilation of this data will provide the sponsor with more detailed information about the population. The next area of analysis will be testing the correlation of each question with the whole of the survey. This information will indicate the degree to which any single question impacts the overall results--how much the response for a question affects the responses to other questions.

In an effort to evaluate the satisfaction with DL within the population, the research team will begin with the mean of responses to individual questions to see if respondents are satisfied or dissatisfied with specific areas of the software application. The team will also break out responses by demographics to determine if a trend exists with regard to what type of person (demographically) may have responded to a question in a particular way. Finally, the team will examine areas of satisfaction with unusually high or low ratings. This data should provide information about the definitive strengths or weaknesses with the DL software.

Administration

The following sections contain the steps taken to implement the survey methodology described above.

Electronic Survey Methodology. Considerable effort was spent in developing a method for surveying users electronically using software tools available to every user at AFMC. These instructions were thought by our sponsor to be worthy of a separate appendix and are attached as Appendix F.

In the wake of our growing environment of "quality awareness" many brand new researchers will be tasked with surveying their customer's needs and doing so quickly. This method could be adapted quite easily to meet their needs.

Survey Instructions. The instructions given with the survey mainly dealt with the complexity of answering the questions using the combination of electronic mail and electronic forms. In addition to a statement regarding the authority for the survey itself, we included a step-by-step instruction set including every prompt the user would encounter, and the actions to be taken. This was by far the largest part of the effort and took several rounds of modification.

Pre-Test Results--Survey Instructions. As part of the survey development, the researchers surveyed 10 users who were familiar with DL. The 10 users were chosen with the help of our sponsor, Major Maureen Casey of the Corporate Information office. The users were reported to be familiar with DL and had been using the system since its initial design and testing phases. In this respect, the users should have been as familiar with the system at AFMC as were any other users. The purpose of the pre-test, as mentioned in the previous section was to assess the content validity of the questionnaire.

The pre-test participants reported that:

- Our original instructions were rather short and lacked detail; assuming that most all users already knew how to pick from a file list box or from a pull-down menu.

- The survey actually looked quite different depending on the particular chosen monitor's resolution and as a result there was confusion as to the values of the scales.
- We might do better to completely drop all reference to our sponsoring agency and the fact that this was an AFIT thesis effort.
- The newly 'simplified' instructions were now quite LENGTHY and might require printing out to follow clearly and avoid keyboard gymnastics.

Based upon this input:

- the instructions were "beefed up" to include all menu choices and intermediate message boxes that a user might be confronted with, along with the appropriate choice of responses.
- the instructions were modified to include a clarification of the intent of the rating scales in case it was difficult to figure out visually.
- the division chief's name was quoted as authority for the survey and no other explanation was given.
- instructions on printing the instruction sheet and a suggestion to do so were added.

Pre-Test Results--Survey Questions. Other than the previous discrepancies, which dealt wholly with the survey instructions, the pre-test participants reported that questionnaire was clear, understandable, and appeared to measure user satisfaction with DL as intended. These results demonstrated the content validity of the research instrument.

Reliability Analysis. The questionnaire was tested using Cronbach's alpha coefficient to test the variables of interest that made up our measure of

user satisfaction. The variables are listed along with the alpha values in the following table.

Table 4

RELIABILITY DATA FOR VARIABLES OF INTEREST

Variable	Questions	Alpha
Overall Satisfaction	11, 13, 22	.89
Productivity	14, 17, 19-21, 28, 29	.91
Reliability	12, 18	.33
Training/Learning	15, 16, 25, 27*	.45*
User Interface	23, 24, 26	.85

* The alpha value for Training was improved to .60 by removing question 27 from consideration.

Survey Administration. Based upon the results of the pre-test, the survey instrument was finalized and administered to 75 users in SI and 10 users in CI at AFMC. Of those surveyed, 8 SI users and 4 CI users returned usable surveys for a response rate of 16 percent of those surveyed.

Population. The test population for the customer satisfaction survey consists of seventy-five members of the AFMC staff who are responsible for developing software systems for use in the command and throughout the Air Force. This population is not merely a sample since it constitutes the entire

population of DL users as of the date of the survey administration. Software developers do not plan to distribute DL Air Force wide until they are satisfied that the product is capable of performing up to expectations.

Survey Results--Demographics. The respondents were mostly civilian male employees, in their thirties or forties, and having some college background. Those with degrees mostly had Bachelor's degrees. All participants had over four years using computers, and most had more than ten. For most, this was the first electronic records management tool that they had used, and they received on-the-job training rather than formal classroom training. Half of the participants had used DL for less than 30 days. Another quarter had it for more than 90 days, and the rest were somewhere in between. This demographic data is summarized in Appendix G.

Survey Results

This section describes the data collected by the survey instrument in accordance with the methodology provided in the previous section. These results are given in the form of descriptive statistics.

Survey Results--Statistics by Variable of Interest. On the average the data supported no significant statement about user satisfaction. As Table 5 shows, all means were between 3.0 and 5.0 with standard deviations of less than 2.0.

Table 5

DESCRIPTIVE STATISTICS BY VARIABLE OF INTEREST

DESCRIPTIVE STATISTICS	Mean	Standard Deviation	Scale Mean	Scale Standard Deviation
Overall Satisfaction				
QUEST11	3.33	1.37	3.47	0.24
QUEST13	3.75	1.48		
QUEST22	3.33	1.37		
Training/Learning				
QUEST15	4.83	1.53	4.29	0.60
QUEST16	3.50	1.38		
QUEST25	4.67	0.98		
QUEST27	4.17	0.72		
Reliability				
QUEST12	3.58	1.56	3.88	0.42
QUEST18	4.17	1.40		
User Interface				
QUEST23	4.75	1.22	4.55	0.21
QUEST24	4.58	1.38		
QUEST26	4.33	1.72		
Productivity				
QUEST14	4.00	1.54	3.77	0.40
QUEST17	3.33	1.15		
QUEST19	4.17	1.90		
QUEST20	4.25	1.76		
QUEST21	3.92	1.38		
QUEST28	3.42	1.38		
QUEST29	3.33	1.37		

Where the standard deviations were less than 1.0, indicating better agreement, the questions dealt with ease of learning and lack of frustration with the system as a whole (questions 25 and.27). A population with at least four years and often more than ten years of computer experience could be expected not to have much difficulty with a new system. Grouping questions

by their common variables of interest, namely Overall Satisfaction level, Productivity improvements, Reliability of the software, Training and Learning ease, and User Interface also revealed no significant trends for further investigation.

IV. CONCLUSIONS AND RECOMMENDATIONS

This chapter contains the conclusions and recommendations of this research. The thesis objectives were to generate a definition of effectiveness for the Records management (RM) field and to determine the impact that Document Librarian (DL) has made on the RM process for the software test population. Two specific investigative questions were identified. The following sections provide an overview of the findings.

Conclusions

Investigative Question 1 How is effectiveness defined for RM?

The research team employed a Delphi process as described in Chapters II and III to generate a consensus among Air Force experts in the RM field in order to define RM effectiveness. Four rounds were required before consensus was reached.

The results of the Delphi emphasize five primary functions that a RM system should provide for its users. The functions are storing, screening, retrieving, disposition, and indexing. These five main functions provide the basis for defining effectiveness for a RM system, according to the expert panel in the Delphi. In order for a system to effectively manage records, it must have the capability to perform all these functions well. The function of storing records includes reducing the possibility of loss and facilitating ease of recovery of documents. Screening involves providing access to records in a logical and systematic way so the records manager is able to scan records for requirements imposed by Privacy Act and Freedom of Information Act statutes. Retrieving records allows searches of documents by a predetermined field to retrieve a desired subset of all records for review. Disposition

instructions are regulatory plans for archival storage and eventual destruction of all records. These instructions are also linked with a record's indexing scheme so that records can be grouped by disposition requirements. The indexing function requires the creation and maintenance of indexes based on characteristics such as key words, document subject, full text, or disposition instructions.

Investigative Question 2 How does Document Librarian impact the process of RM?

The method chosen to evaluate the effectiveness of electronic technology was, as described in Chapters II and III, a customer satisfaction survey of users of the new RM software package DL. The test population was AFMC/CI and SI personnel who have been using and testing the software for the command.

The survey results suggest that the population testing DL has experienced no dramatic improvement or detriment as a result of the software addition to the organization's RM process. Respondents indicated that DL has not improved their job productivity: in fact, they have been slightly dissatisfied with the productivity changes since DL was implemented. They also have indicated by their overall satisfaction that they are unconvinced of DL's usefulness as a tool in their RM process. Overall survey responses indicated they were mildly dissatisfied with DL, responding that the software was not particularly easy to use or helpful in saving them time and did not significantly contribute to improved productivity in their RM tasks.

Recommendations

AFMC/CI personnel (the sponsors of both the development of DL and this research) have maintained high hopes that DL would facilitate a great improvement in the organization's RM productivity. This research has been unable to either confirm or disavow those hopes. Members of the thesis team believe that further research is necessary, however, after two main steps are taken to improve measurement of results.

First, DL should be used for a longer period of time before any evaluation is made. Several of the survey respondents had not used DL for more than 30 days prior to being questioned. Initial dissatisfaction with new work tools like DL is common on the job, and a learning curve can also be expected. With these things in mind, conducting a satisfaction survey so soon after DL's implementation was probably not practical. Workers need time to adjust to the new way of doing their jobs and to become completely familiar with the functions of the software.

Second, a larger number of users should be surveyed in order to ensure a sample which is more representative of the population. Clearly, the response was disappointing and needs further study. Just prior to the administration of the survey, the test population was disbanded and redistributed across AFMC to several locations. This occurrence was probably a major factor in limiting the number of respondents to the survey. Another reason why the number of user surveys returned was much less than expected may in some part be due to the method being used to conduct it. The ease with which an electronic survey can be ignored and the ease with which it can be answered are similar, and the lengthy instructions provided (for simplicity's sake) may have intimidated some. Once stability has returned to

the DL user population, and users have had several months experience with the software, a follow-up survey should be conducted. However, any further evaluation will require much planning and interoffice cooperation to successfully carry out the research.

Since the Delphi identified several key functions necessary for a RM system to be effective, any subsequent evaluation of DL should include those functions as a part of the test. The researchers recommend that the effectiveness criteria labeled by the experts as critical be added to the survey instrument to test whether or not DL satisfies those criteria. Although the criteria were developed at the same time that the survey was being conducted, it is possible that the results of the survey would have been more positive had these criteria been included as part of the questioning. This would further evaluate the usefulness of the software.

The thesis team also recommends that AFMC/CI evaluate other software packages to avoid generalizing all RM software by the evaluation of DL. If the command remains interested in developing a system to electronically manage records, the system developers should not limit the decision makers to the sole choice of DL. Automation is certainly possible with other software.

One final recommendation requires a very different approach than has previously been taken. Even though preliminary results suggest that DL has not improved overall productivity of RM, the problem may not be with the software. DL is designed simply to automate an already existing, manual system of managing records, but what may be needed is an entirely new method of doing the job. AFMC/CI is advised to perform a functional process improvement (FPI) procedure to completely reevaluate the Air Force way of

RM. The purpose and reward of a FPI is to reevaluate current processes and to engineer new and better methods of accomplishing those processes. If the current RM process is not as effective as it could be, merely automating that ineffective process cannot realistically be expected to improve productivity. The time to develop automation software is after AFMC/CI has developed an overall effective and productive RM process through a FPI.

Appendix A: Rating Instructions and Description of Functions

Instructions:

A. Please rate the importance of the following functions within the records management process. Rate each function once, then add any extra functions you regard as important to the process. Please indicate your choice in the space provided (in column ONE on the email).

How important is each of the following to the successful accomplishment of records management? Please answer with one of these choices:

(unimportant) (very important)
1.....2.....3.....4.....5.....6.....7
(undetermined)

___ a. Filtering information: filtering personal from professional information and converting from various formats to an accepted standard

___ b. Making records: generation of standard reports with suspense dates, Freedom of Information/Privacy Act requirements, efficient tracking of revisions, and integration of medium formats (optical disk, magnetic disk, etc.) into a single record

___ c. Assigning disposition instructions automatically

___ d. Indexing records automatically

___ e. Storing records: to eliminate the possibility of loss and allowing for ease of retrieval

___ f. Screening records: allow for easy access to records

___ g. Retrieving records: allow retrieval by predetermined fields and confine access to records as needed

___ h. Allowing the transfer of records to permanent storage sites and maintaining a detailed audit trail

___ i. Destroying records automatically, in accordance with prescribed retention directives

Instructions:

B. In this section, please give additional comments about the records management functions listed above i.e.: why each function is important and what important auxiliary information should be considered for the functions. Your supplementary observations are a vital part in the acquisition of useful research data.

Appendix B: Ranking Instructions

INSTRUCTIONS
A. To rank order:
In the blank next to the statement number, place the number that corresponds to your opinion of the rank order of that statement in relation to the other statements provided. Use numbers 1-9 ,
but use each number only once. Number 1 represents the most important; number 9 represents the least important. Also, at the end of the list of statements we have provided space for you to
make any comments you feel appropriate for other Delphi participants to consider in making their decisions.

___ a. Filtering information: filtering personal from professional information and converting from various formats to an accepted standard
Round 2 - Average: 5.0 Range: 2 to 7

___ b. Making records: generation of standard reports with suspense dates, Freedom of Information/Privacy Act requirements, efficient tracking of revisions, and integration of medium
formats (optical disk, magnetic disk, etc.) into a single record
Round 2 - Average: 5.7 Range: 5 to 6

___ c. Assigning disposition instructions automatically
Round 2 - Average: 5.6 Range: 3 to 7

___ d. Indexing records automatically
Round 2 - Average: 5.9 Range: 4 to 7

___ e. Storing records: to eliminate the possibility of loss and allowing for ease of retrieval
Round 2 - Average: 6.9 Range: 6 to 7

___ f. Screening records: allow for easy access to records
Round 2 - Average: 6.3 Range: 6 to 7

___ g. Retrieving records: allow retrieval by predetermined fields and confine access to records as needed
Round 2 - Average: 6.1 Range: 3 to 7

___ h. Allowing the transfer of records to permanent storage sites and maintaining a detailed audit trail
Round 2 - Average: 5.9 Range: 5 to 7

___ i. Destroying records automatically, in accordance with prescribed retention directives
Round 2 - Average: 4.6 Range: 1 to 7

B. In this section, please give additional comments about your opinions listed above (if desired).

Comments---

Appendix C: Results of Delphi Rounds One and Two

		Rating							
Function	Round	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Total*
a. filtering	**r1**	0	1	0	2	5	3	2	13
	r2	0	1	0	3	5	2	2	13
b. making	**r1**	0	0	1	0	4	7	1	13
	r2	0	0	0	0	4	9	0	13
c. disposition	**r1**	0	1	1	0	4	3	4	13
	r2	0	0	1	0	4	6	2	13
d. indexing	**r1**	0	0	0	2	2	6	3	13
	r2	0	0	0	1	0	11	1	13
e. storing	**r1**	0	0	0	0	0	2	11	13
	r2	0	0	0	0	0	1	12	13
f. screening	**r1**	0	0	0	0	0	9	4	13
	r2	0	0	0	0	0	9	4	13
g. retrieving	**r1**	0	0	1	2	1	3	6	13
	r2	0	0	1	1	0	5	6	13
h. transfer to storage	**r1**	0	0	0	1	2	8	2	13
	r2	0	0	0	0	3	8	2	13
i. destroying	**r1**	1	0	1	0	6	1	4	13
	r2	1	0	2	1	6	2	1	13

Appendix D: Results of Delphi Rounds Three and Four

		Rank									
Function	Round	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*Total*
a. filtering	**r3**	0	0	1	0	1	1	0	6	4	13
	r4	0	0	1	0	1	0	1	7	3	13
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	
b. making	**r3**	1	0	1	2	1	2	4	1	1	13
	r4	1	0	1	2	1	4	3	1	0	13
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	
c. disposition	**r3**	0	2	0	2	4	2	3	0	0	13
	r4	0	1	1	4	3	3	1	0	0	13
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	
d. indexing	**r3**	0	2	0	5	0	3	1	1	1	13
	r4	0	0	0	6	6	1	0	0	0	13
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	
e. storing	**r3**	11	1	0	0	0	0	0	1	0	13
	r4	11	1	0	0	0	0	0	1	0	13
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	
f. screening	**r3**	0	6	4	2	0	0	0	0	1	13
	r4	0	9	2	0	0	0	1	0	1	13
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	
g. retrieving	**r3**	1	2	6	1	1	1	1	0	0	13
	r4	1	2	7	1	0	1	1	0	0	13
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	
h. transfer to storage	**r3**	0	0	1	1	4	1	4	2	0	13
	r4	0	0	1	0	1	3	4	2	2	13
		1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	
i. destroying	**r3**	0	0	0	0	2	3	0	2	6	13
	r4	0	0	0	0	1	1	2	2	7	13

Appendix E: Survey Questions

DOCUMENT LIBRARIAN SURVEY (PAGE 1)

SECTION I. BACKGROUND PLEASE PUT THE CORRECT NUMBER FOR YOUR RESPONSE IN THE BOX NEXT TO THE QUESTION

[ ] 1. WHAT IS YOUR GENDER?

1. MALE
2. FEMALE

[ ] 2. WHAT IS YOUR AGE?

1. LESS THAN 25
2. 26-32
3. 33-39
4. 40-46
5. 47-53
6. 54-60
7. OVER 60

[ ] 3. WHAT IS YOUR HIGHEST LEVEL OF EDUCATION?

1. LOWER THAN HIGH SCHOOL
2. HIGH SCHOOL OR EQUIVALENT
3. SOME COLLEGE BUT NO DEGREE
4. ASSOCIATE 'S DEGREE OR CERTIFICATE
5. BACHELOR'S DEGREE
6. MASTER'S DEGREE
7. DOCTORAL DEGREE

[ ] 4. HOW LONG HAVE YOU USED A COMPUTER?

1. LESS THAN 1 YEAR
2. 1 - 3 YEARS
3. 4 - 6 YEARS
4. 7 - 10 YEARS
5. MORE THAN 10 YEARS

[ ] 5. WHAT IS YOUR OFFICE SYMBOL? (AFMC is assumed)

DOCUMENT LIBRARIAN SURVEY (PAGE 2)

SECTION I. (CONTINUATION) BACKGROUND PLEASE PUT THE CORRECT NUMBER FOR YOUR RESPONSE IN THE BOX NEXT TO THE QUESTION.

☐ 6. IS DOCUMENT LIBRARIAN (DL) THE FIRST ELECTRONIC RECORDS MANAGMENT PROGRAM TOOL YOU HAVE USED (EXCEPT FOR THE RECORDS INFORMATION MANAGEMENT SYSTEM - RIMS)?

1. YES
2. NO

☐ 7. HAVE YOU RECEIVED FORMAL (CLASSROOM) TRAINING ON OPERATING THE DL SYSTEM?

1. YES
2. NO

☐ 8. HAVE YOU RECEIVED ON-THE-JOB (OJT) TRAINING?

1. YES
2. NO

☐ 9. HOW LONG HAVE YOU BEEN USING DL?

1. LESS THAN 30 DAYS
2. 31 - 60 DAYS
3. 61 - 90 DAYS
4. MORE THAN 90 DAYS

☐ 10. WHAT IS YOUR DESIGNATION?

1. CIVILIAN
2. ENLISTED
3. OFFICER

DOCUMENT LIBRARIAN SURVEY (PAGE 3)

SECTION II. SATISFACTION WITH DOCUMENT LIBRARIAN . PLEASE PUT THE CORRECT NUMBER FOR YOUR RESPONSE IN THE BOX NEXT TO THE QUESTION.

☐ 11. **RELEVANCY.** THE DEGREE TO WHICH DL PROVIDES THE SERVICES YOU REQUIRE

1.....2.....3.....4.....5.....6.....7

VERY UNSATISFIED — NEITHER SATISFIED NOR DISSATISFIED — VERY SATISFIED

☐ 12. **RELIABILITY.** THE RELIABILITY OF DL (MINIMUM DOWNTIME DUE TO SOFTWARE FAILURE)

1.....2.....3.....4.....5.....6.....7

VERY UNSATISFIED — NEITHER SATISFIED NOR DISSATISFIED — VERY SATISFIED

☐ 13. **COMPLETENESS.** THE COMPREHENSIVENESS OF DL'S SERVICE CAPABILITIES.

1.....2.....3.....4.....5.....6.....7

VERY UNSATISFIED — NEITHER SATISFIED NOR DISSATISFIED — VERY SATISFIED

☐ 14. **VOLUME OF OUTPUT.** THE OUTPUT OF INFORMATION DL ENABLES YOU TO MANAGE.

1.....2.....3.....4.....5.....6.....7

VERY UNSATISFIED — NEITHER SATISFIED NOR DISSATISFIED — VERY SATISFIED

☐ 15. **UNDERSTANDING OF SYSTEM.** HOW WELL YOU UNDERSTAND DL AND ITS USE.

1.....2.....3.....4.....5.....6.....7

VERY UNSATISFIED — NEITHER SATISFIED NOR DISSATISFIED — VERY SATISFIED

DOCUMENT LIBRARIAN SURVEY (PAGE 4)

SECTION II. (CONTINUATION). SATISFACTION WITH DOCUMENT LIBRARIAN. PLEASE PUT THE CORRECT NUMBER FOR YOUR RESPONSE IN THE BOX NEXT TO THE QUESTION.

☐ 16. **DEGREE OF TRAINING** THE QUALITY OF INSTRUCTION YOU RECEIVED TO DEVELOP YOUR PROFICIENCY IN USING THE DL SYSTEM.

1.....2.....3.....4.....5.....6.....7

VERY UNSATISFIED — NEITHER SATISFIED NOR DISSATISFIED — VERY SATISFIED

☐ 17. **JOB EFFECTS.** THE CHANGES IN JOB PERFORMANCE RESULTING FROM THE IMPLEMENTATION OF THE DL SYSTEM

1.....2.....3.....4.....5.....6.....7

VERY UNSATISFIED — NEITHER SATISFIED NOR DISSATISFIED — VERY SATISFIED

☐ 18. **SECURITY OF INFORMATION.** THE SAFEGUARDING OF INFORMATION FROM MISAPPROPRIATION OR UNAUTHORIZED ALTERATION OR LOSS.

1.....2.....3.....4.....5.....6.....7

VERY UNSATISFIED — NEITHER SATISFIED NOR DISSATISFIED — VERY SATISFIED

DOCUMENT LIBRARIAN SURVEY (PAGE 5)

SECTION II. (CONTINUATION). SATISFACTION WITH DOCUMENT LIBRARIAN. PLEASE PUT THE CORRECT NUMBER FOR YOUR RESPONSE IN THE BOX NEXT TO THE QUESTION.

☐ 19. **PERCEIVED UTILITY.** YOUR JUDGEMENT ABOUT THE USEFULNESS OR THE PRODUCTIVITY OF THE DL SYSTEM.

1.....2.....3.....4.....5.....6.....7

VERY UNSATISFIED	NEITHER SATISFIED NOR DISSATISFIED	VERY SATISFIED

☐ 20. **CONVENIENCE OF ACCESS.** THE EASE OF ACCESS CAPABILITY WITH DL.

1.....2.....3.....4.....5.....6.....7

VERY UNSATISFIED	NEITHER SATISFIED NOR DISSATISFIED	VERY SATISFIED

☐ 21. **INTEGRATION OF SYSTEMS.** THE ABILITY OF DL TO TRANSMIT INFORMATION BETWEEN SYSTEMS SERVICING FUNCTIONAL AREAS OR OTHER LOCATIONS.

1.....2.....3.....4.....5.....6.....7

VERY UNSATISFIED	NEITHER SATISFIED NOR DISSATISFIED	VERY SATISFIED

DOCUMENT LIBRARIAN SURVEY (PAGE 6)

SECTION III. OVERALL APPRAISAL. PLEASE PUT THE CORRECT NUMBER FOR YOUR RESPONSE IN THE BOX NEXT TO THE QUESTION.

☐ 22. OVERALL SATISFACTION WITH DL.

1.....2.....3.....4.....5.....6.....7

VERY UNSATISFIED — NEITHER SATISFIED NOR DISSATISFIED — VERY SATISFIED

☐ 23. USING DL IS:

1.....2.....3.....4.....5.....6.....7

DIFFICULT — EASY

☐ 24. THE USER INTERFACE OF DL IS:

1.....2.....3.....4.....5.....6.....7

CONFUSING — CLEAR

DOCUMENT LIBRARIAN SURVEY (PAGE 7)

SECTION III. (CONTINUATION) OVERALL APPRAISAL. PLEASE PUT THE CORRECT NUMBER FOR YOUR RESPONSE IN THE BOX NEXT TO THE QUESTION.

☐ 25. 1.....2.....3.....4.....5.....6.....7

HARD TO LEARN — EASY TO LEARN

☐ 26. 1.....2.....3.....4.....5.....6.....7

IMPERSONAL — FRIENDLY

☐ 27. 1.....2.....3.....4.....5.....6.....7

FRUSTRATING — NOT FRUSTRATING

☐ 28. 1.....2.....3.....4.....5.....6.....7

TIME WASTING — TIME SAVING

☐ 29. 1.....2.....3.....4.....5.....6.....7

UNPRODUCTIVE — PRODUCTIVE

Appendix F: Survey Instructions

This is a research instrument commissioned by AFMC/CIMR to evaluate the effectiveness of Document Librarian.

This is an OFFICIALLY SANCTIONED Survey under the authority of Mr. Mike Riley, MSC/SI.

Please respond within 5 working days from your receipt of this message.

Thank You for taking the time to fill out our User Satisfaction Survey!

Surveys are an IMPORTANT research tool, and we are attempting to make it as convenient as possible for the user AND researcher by doing it electronically!

NOTE You may wish to print these instructions for convenience in following
them; either click on the Print button or choose FILE from the menu bar and PRINT from the pull-down menu.

1. Attached to this message you will find the survey form "DOCLIB.FRP".
2. View the attachments by a single click on the PAPER CLIP symbol.
3. At the new window, make sure your U: drive is selected in the bottom right corner under Drives. If it is not, click on the arrow beside the Drive box and then select U:.
4. Now click on EXTRACT, which will extract a copy of the file to your U: drive.
5. You will receive a message that the file was extracted.
6. Click on OK.
7. Click on Done.
8. Exit Beyond Mail and return to Windows Program Manager.
9. Select and run the PerForm Pro Filler program.
10. Select FILE from the PerForm Pro menu bar.
11. Select OPEN FORM from the pull-down menu.
12. Make sure the Path is "U:\" and the file is "DOCLIB.FRP". If not, either select or type them in.
13. Click on OK.
14. Select DATA from the PerForm Pro menu bar.
15. Select OPEN DATA FILE from the pull-down menu.
16. In the 'Open Data File' dialog box, make sure the Path is "U:*.DBF" and the file is "DOCLIB.DBF". If not, type them in. Make sure the format is

set to dBASE. If the format is set to ASCII, change the format to dBASE by selecting it.
17. Click on OK.
18. In response to the message stating "Data file not found.." click YES.
** If you don't get this message you somehow already have the data file, which can lead to PROBLEMS! Exit PerForm Filler now and run FILE MANAGER, locate the file U:\DOCLIB.DBF and delete it (press the DELETE key and answer yes to the verification, if any), then return to PerForm Filler and resume with step #9. **
19. In response to the new message stating "New Database created" click OK.
20. ** you should see "DOCLIB.FRP(DOCLIB.DBF)" on the Title Bar at the top of your screen; this is the ONLY way your responses will be saved! **
21. You will now be presented with the survey form on the screen. Depending
on your screen, you may not be able to see the first page completely.
22. Select VIEW from the top menu and FIT SIDES from the pull-down menu to adjust the form to fit your screen. You may wish to enlarge the view for reading ease by selecting VIEW REAL SIZE or VIEW ENLARGE.
23. The black boxes are for your answers and the questions are adjacent to each box.
24. Place the appropriate answer in the first box and then either carriage return or arrow down or TAB to the next one.
25. If you make a mistake or change your mind you can arrow back to the question, hit BACKSPACE and then re-enter the answer.
26. **If the scales in sections two and three do not exactly line up with the responses (different screens once again produce different results), it is intended that the far left side of the scale represents a "1", the midpoint represents a "4", and the far right side a "7"**
27. When you get to question 29 (there are a total of 29 questions in 3 sections on 7 pages) you are finished!!
28. You can wrap from the last question back to the first (with an additional carriage return/down arrow/TAB) to review your answers, or use PageUP and PageDOWN to look at specific pages.
29. To save your answers, from the top menu select DATA and from the pull-down menu select ADD RECORD.
30. Exit the PerFORM Pro Filler program and return to Beyond Mail.
31. Initiate a reply to the initial survey message by highlighting the message and clicking on the REPLY icon.
32. Create an attachment by a single click on the PAPER CLIP symbol.
33. At the new window, make sure your U: drive is selected in the bottom right corner under Drives. If it is not, click on the arrow beside the Drive box and then select U:.
34. Select the file "DOCLIB.DBF" and click on ATTACH.

35. Click on OK.
36. Send the message on its way by clicking on the SEND icon.
ANY questions? or if you don't know where to send replies, address them to 'MOSELEY@wpgate1.wpafb.af.mil'.
(Peter M. Moseley)

Appendix G: Survey Data

In the tables that follow, background data is presented with the possible responses listed in the first column and the frequency of those choices listed in the second column. Microsoft Excel's histogram function was used to group the data by response and gather the frequencies.

Section I

Table 1

GENDER	
Male	9
Female	3

Table 2

AGE	
Less than 25	1
26 - 32	1
33 - 39	4
40 - 46	4
47 - 53	1
54 - 60	1
Over 60	0

Table 3

EDUCATION	
Lower than High School	0
High School or Equivalent	0
Some College but no degree	4
Associate's Degree	1
Bachelor's Degree	5
Master's Degree	2
Doctoral Degree	0

Table 4

COMPUTER USE	
Less than 1 year	0
1 - 3 years	0
4 - 6 years	2
7 - 10 years	2
More than 10 years	8

Table 5

EXPERIENCE & TRAINING			
	First Electronic RM tool ?	Formal Classroom Training ?	On-the-job Training ?
YES	9	2	10
NO	3	10	2

Table 6

USE OF DL	
Less than 30 days	6
31 - 60 days	2
61 - 90 days	1
More than 90 days	3

Table 7

DESIGNATOR	
Civilian	10
Enlisted	2
Officer	0

For consistency with the data in Section I, we have included two tables listing the question number in the first column and the frequencies of each possible response in the remaining columns. The data are separated into

tables representing Section II (Satisfaction with Document Librarian) and Section III (Overall Appraisal) in the survey.

Section II

Table 8

RESPONSE	1	2	3	4	5	6	7
QUEST11	2	1	2	5	2	0	0
QUEST12	1	2	3	3	1	2	0
QUEST13	1	2	1	4	3	1	0
QUEST14	1	1	1	5	3	0	1
QUEST15	0	1	1	3	3	2	2
QUEST16	1	2	2	5	1	1	0
QUEST17	1	2	2	6	1	0	0
QUEST18	1	0	2	4	3	2	0
QUEST19	2	1	0	3	2	4	0
QUEST20	2	0	1	2	4	3	0
QUEST21	1	1	1	5	3	1	0

Section III

Table 9

RESPONSE	1	2	3	4	5	6	7
QUEST22	2	1	2	5	2	0	0
QUEST23	0	0	2	3	4	2	1
QUEST24	1	0	0	4	4	3	0
QUEST25	0	0	1	5	3	3	0
QUEST26	2	0	0	3	4	3	0
QUEST27	0	0	2	6	4	0	0
QUEST28	2	1	1	6	2	0	0
QUEST29	2	1	2	5	2	0	0

The range of responses given in the following table shows little more information than the descriptive statistics. Where there is better agreement,

there is an equally small range of responses, showing that the high degree of computer literacy and the small, reasonably well educated population had little difficulty adjusting to the system. Based on range alone, question 23 dealing with ease of use was the most favorable (no response less than a value of three).

Table 11

RANGE OF RESPONSES	Minimum	Maximum	Range
QUEST11	1	5	4
QUEST12	1	6	5
QUEST13	1	6	5
QUEST14	1	7	6
QUEST15	2	7	5
QUEST16	1	6	5
QUEST17	1	5	4
QUEST18	1	6	5
QUEST19	1	6	5
QUEST20	1	6	5
QUEST21	1	6	5
QUEST22	1	5	4
QUEST23	3	7	4
QUEST24	1	6	5
QUEST25	3	6	3
QUEST26	1	6	5
QUEST27	3	5	2
QUEST28	1	5	4
QUEST29	1	5	4

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Vitae

Mr. Peter M. Moseley was born on 6 August 1958 in Natrona Heights, Pennsylvania. He graduated from Butler Senior High School in Butler, Pennsylvania in 1976 and attended the University of Cincinnati, graduating with a Bachelor of Science in Industrial Engineering in June 1981. For the next year he was a Sales Engineer for the Leeds and Northrup Company in the Louisville, Kentucky Office. He then moved to Dayton, Ohio and worked for Matrix Systems, Incorporated before being offered a job at Wright-Patterson Air Force Base. In December 1985 he accepted an officer candidate appointment in the United States Naval Reserve and attended Aviation Officer Candidate School in Pensacola, Florida. He graduated with academic honors in June 1986 and accepted a commission as an Ensign. He completed the Basic Intelligence Officer's Course and was assigned to the carrier intelligence center onboard USS John F. Kennedy (CV 67), where he served four years and completed several Fleet Exercises and two Mediterranean deployments, the last of which was in direct support of Operation Desert Shield. He left active duty in March 1991 and resumed his civilian career, returning to Air Force Logistics Command in the Information Management Division. Two mergers later he was redesignated as a Management Analyst and entered the Information Management Career Program. Under their sponsorship, he was selected to attend the Air Force Institute of Technology Graduate School of Acquisition and Logistics Management in their Information Resource Management Master's Degree program in May 1993.

Permanent address:
6060 Charlesgate Road
Huber Heights, OH 45424

Capt Dale Austin graduated from Coronado High School in El Paso, Texas in 1980. He then enlisted in the Air Force as an aircraft mechanic, serving two years at Ramstein AB, Germany and eighteen months at Wright-Patterson AFB, Ohio. He then began undergraduate studies at The University of Texas at El Paso after separating from the military. He graduated in 1988 with a Bachelor of Business Administration.

Following graduation, Capt Austin worked for two years in sales and marketing. He reentered the Air Force in 1990 with a commission. His first assignment as an officer was at Little Rock AFB, Arkansas where he served two years as a section commander.

Capt Austin married the former Miss Judith Bernal in 1989. They now have one child, Melissa. After graduation from AFIT, he will be stationed at Davis-Monthan AFB, Arizona where he will be the commander of the base information flight.

Permanent address:
7112 Cerro Negro
El Paso, TX 79912

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13. ABSTRACT *(Maximum 200 words)*

This research was performed for the dual purpose of defining effectiveness as it applies to the field of records management (RM) and studying the impact of Document Librarian (DL) on the productivity of Air Force records managers. The main thrust of the study was to define effectiveness for RM because no standard existed. The definition was generated through a Delphi process with a group of RM experts and took four rounds to achieve acceptable consensus. The Delphi process evaluated major functional areas which a RM system must perform. DL is a RM software package developed jointly by Air Force Material Command (AFMC) and Wang Laboratories. The impact of DL on the productivity of RM was tested through a customer satisfaction survey. Survey questions focused on reliability, job performance, ease of use, utility, and overall appraisal. The survey revealed that the software is average from a user satisfaction point of view. According to responses received, users had not significantly improved their RM productivity with DL's capabilities. Also, DL was not significantly easier to use or learn or even more user-friendly than other software, leaving the product's testers unsure whether DL's usefulness warrants its purchase and wider distribution throughout the Air Force.

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